Department of Pesticide Regulation

Mary-Ann Warmerdam
Director

Arnold Schwarzenegger
Governor

December 30, 2005

The Honorable Wesley Chesbro
Chair of the Joint Legislative Budget Committee
State Capitol, Room 5035
Sacramento, California 95814

Attention: Ms. Peggy Collins

Dear Senator Chesbro:

Item 3930-001-0001 of the Supplemental Report of the 2005 Budget Act requires the Department of Pesticide Regulation (DPR) to submit to the Legislature (on or before January 1, 2006) a report containing all of the following information:

a. The number of risk assessments conducted by the Department in the preceding year.
b. The names of the active ingredients for which those risk assessments were prepared.
c. The number and nature of comments made by other agencies and the public about the risk assessments, and the Department's disposition of those comments.
d. A description of the Department's process for reviewing, considering, and responding to external reviews and comments on its risk assessments, including those reviews and comments made by the Office of Environmental Health Hazard Assessment (OEHHA).

Background and Definition of Terms

DPR takes a multimedia approach to risk assessment and assesses potential dietary, workplace, residential, and ambient air exposures. We develop comprehensive human health risk assessments in the form of risk characterization documents (RCDs). Our RCDs follow the accepted risk assessment protocols of the California Environmental Protection Agency (Cal/EPA), as recommended by the National Academy of Sciences. An RCD consists of these sections: introduction, physical and chemical characteristics, environmental fate, toxicity profile, hazard identification, exposure assessment, risk characterization, risk appraisal, conclusions, and appendices. The *toxicity profile* is an evaluation of toxicity and dose-response data for the chemical. H*azard identification* is a more in-depth discussion of the critical toxicity studies, endpoints, and values that are selected as the basis for the risk characterization calculations. E*xposure assessment* is a qualitative and quantitative discussion of the various exposure scenarios and values. R*isk characterization* quantifies the estimates of risk, based on the information in the hazard identification and exposure assessment sections. The *risk appraisal* contains a discussion of the various uncertainties, significant issues, and assumptions in the RCD. Nondietary exposure information is taken from the more detailed exposure assessment document (EAD).

For the purposes of this report, the terms "risk assessment" and "RCD" are interchangeable. The RCD is considered to include the EAD. All RCDs are sent to OEHHA for review and comment. RCDs may also be sent to the U.S. Environmental Protection Agency (U.S. EPA) and the registrants of the pesticide under evaluation. Pesticide active ingredients under consideration as possible toxic air contaminants (TACs) will also be sent to the Scientific Review Panel (SRP) for formal and informal review and comments, per section 14023 of the Food and Agricultural Code. This type of external peer review provides critical information for DPR on the scientific completeness of its documents. DPR scientists respond to the reviewers and make changes in the RCD as appropriate. In addition, as new data become available, we may update the RCD with appendices.

To protect public health and ensure the integrity of our science, we strive to keep our scientists removed from any risk management influences. In fact, DPR continually evaluates and monitors the process to ensure that risk assessment is separate from risk management. RCDs are prepared and finalized without involvement or approval from DPR risk managers. The risk assessment process is under the direction of DPR's Assistant Director of the Division of Registration and Health Evaluation. The risk management team is led by DPR senior executive staff headed by the Chief Deputy Director. Risk assessment often drives risk management, but risk management cannot and does not drive risk assessment at DPR. The decision to decide whether risks are unacceptable rests with DPR risk managers. This is part of the *risk management* process. Risk management is the evaluation and selection of mitigation options (i.e., evaluation and selection of ways to reduce unacceptable risks).

In making our risk management decisions, we take into account not just the recommendations of DPR staff, but consider all peer review comments. For example, if the comments indicate there is no disagreement with major issues in the RCD, it adds to the weight of evidence to support the RCD conclusions and the subsequent selection by the risk manager of mitigation options. On the other hand, should there be unresolved disagreements with DPR risk assessment assumptions or conclusions, the risk manager can take this into account when deciding mitigation options affecting the level of any restrictions and the urgency in which they are implemented.

In responding to the request for "the number of risk assessments conducted, the term "conducted" can be interpreted as covering various stages of completion and transmittal to management. An RCD is "conducted" if it has been sent for formal external review by OEHHA at a minimum, as well as by any other external person or group. For the purposes of this report, DPR is taking an inclusive approach to reporting the requested information. If an RCD was "conducted" before October 1, 2004, but comments were received from OEHHA between October 1, 2004, and September 30, 2005, or DPR completed its formal response to the comments between October 1, 2004, and September 30, 2005, the relevant information is included in this report.

a. The number of risk assessments conducted by the Department in the preceding year.

Risk assessments (in the form of RCDs) on seven active ingredients meet the criteria or definitions established above.

b. The names of the active ingredients for which those risk assessments were prepared.

The active ingredients are carbofuran, chlorothalonil, methamidophos, methidathion, methyl parathion, propargite, and sulfuryl fluoride.

For clarity and to provide context to better under responses to Item (c), we will respond to Item (d) first.

d. A description of the Department's process for reviewing, considering, and responding to external reviews and comments on its risk assessments, including those reviews and comments made by OEHHA.

Risk assessments are initiated through a consultative process that relies on scientific recommendations from other agencies, as well as those from the public. Our objective is to initiate risk assessments on those pesticides of the greatest risk and public concern. When a risk assessment is initiated, it is announced in a public notice that is electronically mailed to interested parties and posted on DPR's Web site. When the risk assessment has progressed to a point where DPR scientists have selected the definitive toxicity/exposure information, another public notice is issued and similarly distributed. This notice identifies the definitive toxicity/exposure studies and critical endpoints/no-observable effect levels and invites the submission of additional scientific data that are relevant to the risk assessment. After the draft RCD has been completed by the primary author(s), senior toxicologists at DPR review it. Following this internal peer review, the RCD is revised as appropriate. This draft RCD is sent to OEHHA and U.S. EPA with a formal request for comments. At this time, the draft is not considered to be a public document. However, the registrant is given the option of also reviewing this draft of the RCD. If the registrant elects to review the RCD, DPR considers it to be a public document and it is available to anyone who requests it.

While unusual for U.S. EPA to provide formal comments to DPR, there is a frequent exchange of information between scientists. All RCDs are sent to OEHHA for external peer review, and OEHHA provides formal comments to DPR pursuant to its statutory obligations. The primary author(s) of the RCD consider all submitted comments, prepare responses to the comments, and revise the RCD as appropriate. Senior DPR toxicologists again review the revised RCD to ensure its scientific completeness and rationale of the assessment. A final RCD is completed and sent to DPR's Assistant Director for Registration and Health Evaluation for approval. DPR considers the RCD to be a public document at this time. We

provide copies of our responses to those who provided comments. Additional external peer review could also occur at this time, such as under section 57004 of the Health and Safety Code. Upon approval by the Assistant Director, the document is sent to DPR's Chief Deputy Director with a recommendation regarding the need for risk mitigation. The risk mitigation (risk management) takes place in an entirely separate process. The final RCD package contains all the comments and DPR's responses to the comments.

There are additional steps if the pesticide is considered a potential TAC and the RCD will undergo review by the SRP. The RCD includes a separate EAD and environmental fate document. In addition to OEHHA, the draft documents are sent to ARB for review and comment. Following revision to address the external comments, the RCD (including the EAD and environmental fate document) is released and noticed for public comment and a public workshop is held. All comments received as a result of the workshop or public comment period are considered. The documents are revised in response to the comments and again undergo internal peer review. The documents are then sent to the SRP for review (along with a volume containing all the comments and DPR responses). DPR scientists work with assigned leads of the SRP in preparing the evaluation for consideration by the SRP at a public meeting. DPR addresses the SRP comments before the evaluations are accepted by the Panel.

c. The number and nature of comments made by other agencies and the public about the risk assessments, and the Department's disposition of those comments.

DPR received comments from OEHHA on all seven risk assessments discussed in this report. In addition, six affected registrants submitted comments. U.S. EPA did not provide written comments but did occasionally provide informal staff consultation. In general, the registrants submitted comments and, occasionally, additional data to refute the recommendations of DPR scientists. There were no circumstances when the registrants concurred with DPR scientists. The most detailed and documented comments were received from OEHHA. In all but one risk assessment (methyl parathion), OEHHA agreed with the risks identified in the RCDs. OEHHA provided many comments that generally sought to strengthen the clarity of the scientific conclusions. A more detailed summary which includes comments received and DPR's response is included as an appendix.

As previously noted, DPR scientists respond to every comment received on its risk assessments. The risk assessment documents are either modified to reflect the comment or DPR staff response to comments are included in the risk assessment package. Three of the risk assessments (methidathion, methyl parathion, and sulfuryl fluoride) involved ambient air risks and were processed under the Toxic Air Contaminant Act. The TAC process included a hearing and a public comment period. The TAC documents must include findings from OEHHA and ARB before undergoing final review and approval by the SRP.

Closing Comments

We value and attach a great deal of importance to the independent scientific peer review of our risk assessments. In particular, we consider the detailed external peer review by OEHHA of all RCDs to be a critical part of the risk assessment process. Having peer review from a separate risk assessment group like OEHHA enhances and strengthens our RCDs by ensuring diverse perspectives and independent critical analysis. All external review comments, including those of OEHHA, are considered in detail and the RCDs are revised to address these comments. As with any scientific review process, DPR scientists do not necessarily adopt all recommendations; however, they are addressed.

Although our risk assessment process is based on sound scientific principles, we know that improvements can and should be sought. We are reassessing a number of programs, including risk assessment, to instill greater transparency. One way to increase transparency includes more opportunity for public comment. In early 2004, we modified how we prioritize pesticides for risk assessment and provide greater opportunity for public participation. In the coming months, we anticipate modifying how we develop risk mitigation options to ensure adequate public input. In the same regard, we are evaluating a process to make draft RCDs available for public comment in a process similar to that now used for RCDs undergoing TAC review. The public comment would take place after the RCDs have been revised in response to the external peer review by OEHHA.

Our risk assessments are widely respected and I am committed to ensure that they continue to be based on sound science. If you have any questions, please do not hesitate to contact me, or your staff may wish to contact Mr. Chris Reardon, DPR's Legislative Director, at (916) 445-3976.

Sincerely,

Mary-Ann Warmerdam
Director
(916) 445-4000

Attachment

cc: See next page.

cc: Mr. E. Dotson Wilson, Chief Clerk of the Assembly (w/Attachment)
State Capitol, Room 3196, Sacramento, California 95814

Mr. Gregory Schmidt, Secretary of the Senate (w/Attachment)
State Capitol, Room 400, Sacramento, California 95814

Ms. Diane Boyer-Vine, Legislative Counsel (w/Attachment)
925 L Street, Suite 900, Sacramento, California 95814

Ms. Elizabeth Hill, Legislative Analyst (w/Attachment)
925 L Street, Suite 1000, Sacramento, California 95814

Mr. Richard Costigan, Legislative Secretary (w/o Attachment)
Office of the Governor, State Capitol, Sacramento, California 95814

Ms. Susan Hildreth, State Librarian (w/three Attachments)
Stanley Mosk Library and Courts Building
P.O. Box 942837, Sacramento, California 94237-0001

Mr. Chris Reardon (w/Attachment)

Appendix
Summary of Comments on Specific
Risk Characterization Documents

Carbofuran

On May 23, 2005, FMC Incorporated, the carbofuran registrant, provided comments in response to a Department of Pesticide Regulation (DPR) "Notice to Pesticide Registrants Identification of Definitive Toxicity/Exposure Studies and Critical Endpoints/NOELs for the Active Ingredient Carbofuran." FMC questioned the selection of the specific study and toxicological endpoint for evaluating acute exposure, the studies used to evaluate subchronic and chronic toxicity, and the data used to determine the exposure of pesticide handlers recommended the use of a lower dermal absorption value. FMC provided additional data with which to evaluate the exposure of worker's reentering fields, recommended the use of more recent food residue data, and expressed general agreement with the approaches used by DPR to estimate bystander and ambient air exposures to carbofuran.

A draft risk characterization document (RCD) on carbofuran was sent to the Office of Environmental Health Hazard Assessment (OEHHA) for peer review on June 1, 2005. The RCD was also sent to the U.S. Environmental Protection Agency (U.S. EPA) for comment on the same date. No formal comments were received from U.S. EPA; however, there have been scientific discussions between the primary author of the RCD and the corresponding scientist at U.S. EPA. OEHHA provided formal comments and recommendations to DPR in the form of a memorandum dated July 7, 2005. Without reproducing the OEHHA comments in their entirety, they are summarized below:

- OEHHA agreed with the selection of the toxicity study, the toxicity endpoint, and the no-observed adverse effect level (NOAEL) from that study as the basis for selecting the acute regulatory value for the risk assessment. While OEHHA also agreed with the selection of endpoints and NOAELs in the subchronic and chronic studies, they expressed concern that the subchronic and chronic regulatory values were higher than the acute value, and recommended that the acute value be used to evaluate seasonal and chronic exposures.

- OEHHA recommended the use of a different factor for dermal absorption and pointed out an apparent discrepancy in the values used for inhalation absorption. OEHHA expressed concern that exposure was not properly estimated from the hypothetical maximally exposed individual and that estimates of acute air exposure did not sufficiently account for potential short-term spikes. OEHHA recommended that chronic occupational exposure to carbofuran be evaluated in the RCD and that the occupational exposure estimates be further validated. OEHHA shared DPR's conclusions that many of the calculated occupational and bystander (but not ambient

air) margins of exposure (MOEs) indicated potential health concerns and recommended that DPR expedite the development of mitigation measures.

DPR is currently preparing a major revision to the RCD as a result of comments received. When the RCD has been revised, a formal response to the comments will be prepared. Not all suggestions will be followed; however, the formal response will have an explanation of why the particular suggestion was not incorporated.

Chlorothalonil

On September 9, 2004, DPR sent the draft dietary RCD for chlorothalonil to OEHHA, U.S. EPA, and Syngenta (the primary registrant) for review and comment. This RCD only evaluated the risks of dietary exposure. No formal comments were received from U.S. EPA. Syngenta provided formal comments to DPR on October 15, 2004. OEHHA provided formal comments to DPR on December 2, 2004.

Syngenta recognized that the RCD concluded that the dietary exposure did not pose a health concern but recommended the use of a "percent of crop treated" adjustment if there were a change in the dietary exposure profile. Syngenta indicated that it would provide refined dietary exposure data if there were such a change. Syngenta also requested a revision to a table in the RCD to reflect additional studies submitted by Syngenta. The primary author of the RCD addressed the Syngenta comments in a memorandum on November 17, 2004. DPR said that the dietary exposure would be reevaluated if there were a change in the dietary exposure profile and that the RCD would be revised to note this. The table in question was revised as suggested. The formal DPR responses were sent to Syngenta on November 23, 2004.

OEHHA's sole substantive concern with the RCD was that subchronic/seasonal dietary exposure was not evaluated. OEHHA was concerned since the subchronic and chronic NOAELs were similar, and that potentially higher subchronic dietary exposure could be higher than the averaged chronic exposure. This would assume subchronic exposure at the highest detected residues as were used in assessing acute dietary exposure. Other than that concern, OEHHA found the dietary RCD to be "appropriate, comprehensive, and well written." OEHHA agreed with the choice of critical studies, the selection of the NOAELs, and the selection of the endpoints.

The primary author of the RCD addressed the OEHHA comments in a memorandum dated December 8, 2004. The memorandum notes that in a subchronic exposure scenario, some individuals in a population subgroup could potentially have an exposure that was higher than the chronic (average) exposure, depending on the consumption pattern. However, the overall exposure would be expected to be closer to chronic, since it is unlikely that individuals would consume commodities containing residue at the highest detected levels (acute) for the entire season. In addition, even assuming subchronic or seasonal exposure at the acute residue levels, the resulting exposures would still be well below those indicative of a health concern. The memorandum states that the RCD will be revised to include additional clarifying discussion.

Following revision of the RCD to address the comments of OEHHA and Syngenta, the RCD was sent to DPR's Assistant Director for Registration and Health Evaluation for approval on January 6, 2005. The RCD includes the comments from OEHHA and Syngenta, along with DPR's responses to those comments. The RCD was revised as a result of OEHHA's comments and includes responses to OEHHA's comments.

Methamidophos

A RCD on methamidophos was sent to OEHHA, U.S. EPA, and Bayer Crop Science (BCS, the main registrant) for review on November 7, 2003. No formal comments were received from U.S. EPA. DPR received peer review comments from OEHHA on January 16, 2004. BCS provided comments to DPR on February 28, 2004, which included comments from Valent USA, another registrant. The RCD evaluated all exposure routes and scenarios.

BCS expressed concern with the choice of oral toxicity studies used to evaluate occupational risk, stating that dermal toxicity studies were available and more scientifically appropriate for this use. BCS recommended the use of a 1973 human study as a basis for determining that rats and humans were similar in response and eliminating an uncertainty factor. BCS expressed concern with apparent inconsistencies with DPR's dietary risk assessment methods. BCS contended that the methamidophos use patterns did not result in chronic occupational exposure. Valent's comments addressed the toxicity studies and endpoints selected for evaluating occupational risk (similar to those of BCS), the characterization of the toxicity of acephate as compared to that of methamidophos, and several editorial corrections.

The primary authors of the RCD addressed the BCS and Valent comments in a memorandum dated February 4, 2005. DPR agreed with the BCS and Valent arguments that the dermal toxicity studies were the most appropriate for conducting occupational exposure assessments. As a result, studies and no-observable effect levels (NOELs) for assessing occupational risk were changed in the RCD due to use of dermal studies in the rat. The memorandum noted that the human subchronic study referred to by BCS had been received and reviewed by DPR; however, the DPR review concluded that several factors compromised the scientific validity of the study, making it inadequate for the purpose of quantitative risk assessment. The memorandum noted that the best protocols for assessing dietary exposure are evolving, especially as refinements are being made to dietary exposure software. In addition, different approaches may be more scientifically appropriate for different pesticides, depending on the available data. Regarding the potential for chronic exposure, the memorandum notes that methamidophos labels permit year-round use and the DPR pesticide use reports indicate year-round use. The occupational exposure estimation was rewritten in response to registrant comments and to conform with modified DPR assumptions regarding occupational exposure. The formal DPR responses were sent to BCS on March 4, 2005.

OEHHA agreed with DPR's choices of critical studies, toxicological endpoints, and NOAELs. OEHHA agreed with DPR's use of uncertainty factors. OEHHA expressed concern that the MOEs were less than 100 (the value conventionally recommended to protect people) for many occupational exposures and recommended expediting mitigation measures. OEHHA noted that the dietary exposures resulted in margins of exposure (MOEs) greater than 100, but that the dietary assessment did not evaluate cumulative exposure to other chemicals (methamidophos is a major degradate of another pesticide, acephate). Further, the residue tolerances for tomatoes indicated concern and should be discussed with U.S. EPA.

The primary author of the RCD addressed the OEHHA comments in a memorandum dated February 7, 2005. The memorandum notes that the NOELs for assessing occupational risk had changed following the use of dermal toxicity studies to better characterize such risk. DPR is also concerned with the low MOEs and the memorandum indicates that risk mitigation (risk management) will be dealt with, but separately from risk assessment. The memorandum notes that the final draft of the RCD for acephate is in review within DPR; and when it is completed, it will enable the cumulative risk from exposure to acephate and methamidophos to be estimated. The RCD includes OEHHA's comments and DPR's responses to those comments.

Following revision of the RCD to address the comments from OEHHA, BCS, and Valent, the RCD was sent to DPR's Assistant Director for Registration and Health Evaluation for approval on June 27, 2005. The RCD includes the comments from OEHHA, BCS, and Valent, along with DPR's responses to those comments.

Methidathion

In 2001, DPR completed an RCD for methidathion addressing dietary and drinking water exposure. This RCD was sent to U.S. EPA, OEHHA, and Gowan (the registrant) for review. OEHHA and Gowan provided comments, and DPR responded and revised the RCD as appropriate. In 2002, the RCD was revised with the addition of an addendum evaluating occupational exposure. This addendum was sent to U.S. EPA, OEHHA, and Gowan for review and comment. Gowan and OEHHA provided comments in 2003, and DPR responded.

The addendum was revised in October 2003 with the addition of an evaluation of ambient air exposure. This addendum also indicated that methidathion was a candidate for consideration as a toxic air contaminant (TAC). This addendum was sent to Gowan, OEHHA, and U.S. EPA in December of 2003 for review and comment. Gowan provided comments on the addendum on March 9, 2004, and DPR responded on June 4, 2004. OEHHA provided comments on February 20, 2004, and DPR responded on August 4, 2004. Also as part of the mandated TAC process, on March 5, 2004, OEHHA provided draft findings on the health effects of methidathion.

The RCD was rewritten to incorporate the addendum into the body of a single comprehensive RCD and to address and incorporate, as appropriate, the OEHHA and

Gowan comments. As part of the TAC process, on August 8, 2005, a public comment period was opened, focusing on the ambient air portions of the comprehensive RCD. and was closed on September 26, 2005. On August 19, 2005, at a meeting of DPR's Pesticide Registration and Evaluation Committee, DPR conducted a public workshop focusing on the ambient air exposure portions of the RCD. Comments received in response to the workshop and public comment period are currently being reviewed by DPR. After revision in response to these comments, the Scientific Review Panel (SRP) will evaluate this document and consider methidathion as a possible TAC. OEHHA findings will be used by the SRP as part of its deliberations. The following discussion will concentrate on the comments made in relation to the last addendum, the responses to those comments, and the resulting revised RCD that was released for public comment in 2005.

In its March 9, 2004, comments, Gowan asserted that the cancer data were more supportive of a threshold rather than a linear dose response and criticized the quantification of cancer risk as being overly conservative. Gowan criticized the statistics used by DPR in estimating exposure as being too conservative. Gowan asserted that short-term and long-term exposure estimates should be based on mean, not on upper-bound or upper-confidence limits. Gowan felt that the annual exposure was overestimated, since the air measurements were made in the county of highest use during the highest use period of the year, and annual variations in use were not considered. Gowan asserted that there was a selective use of data, since the RCD based the estimates of ambient exposure on the air measurements at the sampling site with the highest methidathion concentrations. Gowan criticized the estimates of subchronic and chronic occupational exposure as significantly overestimated. Gowan also criticized the choice of noncancer toxicity endpoints as different from that of U.S. EPA and too conservative.

DPR considered Gowan's comments and sent a response on June 4, 2004. DPR noted that while U.S. EPA may not have considered the cancer evidence sufficient to calculate a cancer risk, it was the collective scientific opinion of toxicologists at DPR that the data were not sufficient to support a threshold mechanism (no mechanistic data were presented by Gowan). The default assumption was that a linear dose-response mechanism was appropriate and that cancer risk should be quantified. Regarding the criticism of the short-term and long-term exposure estimates, DPR noted that the upper-bound is used to estimate short-term exposure because the data indicate that such exposures can occur. DPR explained that the upper-bound was used for the estimates of long-term occupational exposure to address the limitations in the existing database. Regarding the reliance on the measured ambient air levels from the collection site with the highest air measurements, DPR responded that it was concerned about protecting the residents who lived around that site and could thus be chronically exposed to the air levels at that site. DPR defended the use of the maximum (allowed by the label) application rates for estimating long-term as well as short-term occupational exposure. However, DPR did modify the exposure estimates to address that fact that some uses have decreased in recent years to the point that it is not practical to estimate seasonal and annual exposure of pesticide handlers by DPR's standard methodology. Regarding the choice of non-cancer endpoints, DPR defended the use of the more sensitive rat neurotoxicity study as opposed to the dermal toxicity study used by U.S. EPA, since the

rat study had a much more thorough evaluation of neurological signs and the dermal studies had several deficiencies.

In its February 20, 2004, comments, OEHHA agreed with the choice of the neurotoxicity study, the endpoint, and the selection of the lowest-observed effect level (LOEL) for evaluating acute exposure, but disagreed with DPR's use of the uncertainty factor of three to estimate the NOAEL, recommending instead the use of a factor of ten. OEHHA recommended the use of a default inhalation factor of 100 percent instead of the factor of 50 percent that was used by DPR. OEHHA recommended that seasonal and chronic exposures be estimated for a "hypothetical maximally exposed individual." While OEHHA agreed with DPR's study choice and endpoint selection for evaluating chronic exposure, OEHHA recommended additional discussion to support and clarify that selection. OEHHA also recommended changes to the characterization of some of the genotoxicity data.

DPR considered OEHHA's comments and sent OEHHA a detailed response on August 4, 2004. DPR presented additional discussion of the neurotoxicity study used to evaluate acute exposure, but still felt that the data supported the use of an uncertainty factor of three. Additional supporting data and discussion were added to the RCD in response to OEHHA's concern. Regarding the recommendation of the use of a default inhalation absorption factor of 100 percent, DPR responded that it was in the midst of reevaluating several long-standing defaults, including this one. This reevaluation indicated that 100 percent was, in fact, a more appropriate and health-protective factor and should be used in the absence of other data. Exposure and risk estimates in the RCD were revised to reflect a default inhalation absorption factor of 100 percent. DPR considered the hypothetical maximally exposed individual, but felt that the decrease in the use of methidathion made the exposure estimates more likely to be overestimates than underestimates. Thus, the multiple nearby applications required for the maximally exposed individual would be unlikely. DPR added additional discussion to the RCD supporting the selection of the chronic study, as suggested by OEHHA. Based on the opinion of DPR's genotoxicity expert, DPR did not make the changes to the characterization of the genotoxicity studies as recommended by OEHHA.

As noted above, the comprehensive RCD is being revised in response to the comments received during the public comment period, and those comments will receive formal responses. The SRP will consider the RCD, the various comments, and DPR's responses to those comments during its peer review of the health evaluation of methidathion and its consideration of methidathion as a TAC.

Methyl Parathion

In 1999, DPR completed the evaluation of methyl parathion as a TAC and initiated the process to formally identify it as a TAC. This process, which only addressed the potential health effects of exposure to methyl parathion in the ambient air, included comments from OEHHA, the registrant, and the public, as well as DPR's response to

those comments. SRP review and DPR interaction and response to the SRP were also part of the process, culminating in SRP acceptance of the health assessment document.

Subsequent to the completion of the TAC review, additional toxicology studies were received by DPR which permitted a refinement of the selection of critical studies and endpoints. A draft RCD was completed which included the new toxicity data and an evaluation of dietary, ambient air, and occupational exposures. The draft RCD was sent to OEHHA on August 11, 2003, for peer review and comment. OEHHA provided comments to DPR on September 15, 2003. As a result of one of OEHHA's comments and a reexamination of its occupational exposure assessment practices, a significant revision to the occupational exposure was initiated. However, the dietary exposure assessment indicated health concerns regarding residues of, and tolerance levels for, methyl parathion in food. In this same time frame, U.S. EPA was conducting its dietary assessment of methyl parathion and proposing the revocation of several food uses. As a result, DPR completed the RCD on the dietary and ambient air exposures instead of waiting for the revised occupational exposure assessment to be completed. The occupational exposure and corresponding risk evaluation will be added as an addendum at a later date. DPR completed the dietary and ambient air RCD and transmitted it to DPR's Assistant Director for Registration and Health Evaluation for approval on October 25, 2004. Also on October 25, 2004, DPR provided to OEHHA the October 25 draft of the RCD, along with formal responses to their September 15, 2003 comments. DPR management approved the RCD on March 2, 2005.

In their September 15, 2003 comments, OEHHA questioned the different critical studies, endpoints, and NOELs in the RCD, as opposed to the 1999 TAC document, and recommended more justification of the new selections. OEHHA recommended including more than one estimate of risk for each exposure scenario, as was done in the TAC evaluation. OEHHA suggested including a special section on sensitive subpopulations and recommended the inclusion of an additional uncertainty factor of ten in calculating the risk to infants and children to reflect pre- and post-natal sensitivity. OEHHA recommended that the RCD give more emphasis to tumor findings and potential oncogenicity. OEHHA requested that the RCD include a copy of the DPR Summary of Toxicology Data for Methyl Parathion. OEHHA also made several editorial suggestions and corrections.

In the October 25, 2004, response to OEHHA's comments, DPR explained that the differences in the critical studies, endpoints, and NOELs between the TAC document and the RCD were due to the availability of several new toxicology studies that permitted a refinement of the toxicological values, especially for those values that were extrapolated in the earlier TAC document. These improvements to the toxicity database permitted a reduction in uncertainty and avoided reliance on lesser-quality studies. However, for the sake of clarity, a table was included that compared the differences in the values between the two documents, along with an expanded explanation. The inclusion of more than one risk estimate for a given exposure scenario in the TAC document was due to the substantial uncertainty that existed. The additional toxicology studies significantly reduced the uncertainty, making it unnecessary to use all the different risk estimates.

With regard to the potential sensitivity of subgroups to methyl parathion, DPR noted that the issue was discussed in detail in the TAC document and SRP review, and the current RCD extended the discussion by including the additional studies, especially the developmental neurotoxicity study; however, data indicating a greater toxic response in sensitive adult populations were not available. DPR also responded that based on the findings from the developmental and reproductive toxicity studies, the TAC and RCD concluded that immature organisms were more sensitive to methyl parathion than adults. However, the NOEL for subchronic toxicity was derived from a developmental neurotoxicity study; therefore, it was not necessary to consider an additional uncertainty factor to protect infants and children. Regarding the suggestion that the carcinogenic potential of methyl parathion be given more emphasis, DPR pointed out that the issue was discussed in detail in the TAC document, the conclusions of which were supported by the SRP. Since no additional oncogenicity studies were available, there was no need to expand the section.

As recommended by OEHHA, the DPR Summary of Toxicology Data for Methyl Parathion was included with the RCD. DPR also revised the RCD to address the several editorial suggestions and corrections that were made by OEHHA.

Propargite

A draft RCD evaluating dietary and drinking water exposures to propargite was completed July 9, 2004. An evaluation of occupational exposure will be added as an addendum at a future date. On July 14, 2004, the RCD was sent to U.S. EPA and OEHHA for review and comment. U.S. EPA did not provide formal comments. OEHHA provided formal comments on the RCD on August 26, 2004.

OEHHA found the RCD to be "appropriate, comprehensive, and well-written." Accordingly, their comments focused on relatively few areas of concern. OEHHA was concerned that the chronic NOEL selected to evaluate chronic dietary exposure (3.8 mg/kg) was higher than the acute NOEL used to evaluate acute exposure and recommended that the lower acute NOEL be used to evaluate chronic exposures. OEHHA recommended the use of a subchronic dermal study to evaluate chronic exposure or additional discussion in the RCD to support not using the study. OEHHA recommended adding an evaluation of seasonal dietary exposure to the acute and chronic exposure evaluations. OEHHA recommended increased monitoring for propargite residues in California commodities. OEHHA noted significant differences between the values used by U.S. EPA and DPR for surface water concentrations in evaluating carcinogenic risk. Finally, OEHHA noted that the DPR tolerance assessment yielded acute MOEs for some commodities that were below the level generally considered to be protective of human health and recommended that DPR advise U.S. EPA of this issue.

The primary author of the RCD addressed the OEHHA comments in a memorandum dated October 4, 2004. DPR noted that while the chronic NOEL was slightly higher than the acute NOEL, the difference was small and could easily be the result of dose selection.

In addition, the lowest chronic MOE was almost 100-fold higher than the level conventionally considered to be adequately protective of human health. The use of a short-term NOEL to evaluate chronic exposure would only add confusion, without affecting the bottom-line conclusion of the RCD. Regarding the subchronic dermal study, DPR indicated that it would be used to evaluate occupational dermal exposure but was inappropriate to use for evaluating dietary or drinking water exposure, since severe dermal irritation was one of the primary effects. Regarding seasonal dietary exposure, DPR pointed out that the national pesticide residue database does not support a determination of seasonal variation in residue levels. The existing consumption data indicate that when a pesticide has uses on more than a few commodities, the overall exposure will not vary significantly from season to season. While the consumption of one commodity could decrease from one season to another, the consumption of another commodity would increase in its place and the overall intake of the pesticide residue would not change significantly. This was true for the commodities on which propargite was used. Thus, DPR concluded that this did not support the conduct of a separate seasonal exposure analysis. DPR noted that in recent years, it reduced the number of commodity residue samples as a result of budgetary constraints. Regarding surface water concentrations, DPR pointed out that U.S. EPA used a model to derive its drinking water levels, while DPR used actual surface water residues collected in California. Regarding the issue of the propargite tolerances, DPR noted that a copy of the draft RCD had been sent to U.S. EPA, but that DPR did not have the authority to modify federal residue tolerances in food.

The RCD was sent to DPR's Assistant Director for Registration and Health Evaluation for approval on October 4, 2005.

Sulfuryl Fluoride

On March 16, 2004, DPR completed the first draft of the RCD on the sulfuryl fluoride for structural fumigation, which was the only labeled use at the time. This RCD evaluated all relevant exposures to sulfuryl fluoride in a single comprehensive document, including both ambient air and occupational exposures. The RCD was written to also serve as the basis for evaluation in the TAC process, in which the SRP reviews a health evaluation document (the RCD serves as this document), a separate exposure assessment document (EAD), and an environmental fate document (EFD). All documents are relevant to the current report.

On March 29, 2004, the RCD, EAD, and EFD were sent to OEHHA, the Air Resources Board, and U.S. EPA for scientific review. On April 19, 2004, both documents were sent to the registrant, Dow AgroSciences (Dow) for review. On April 4 and April 7, 2004, OEHHA and ARB, respectively, provided formal comments to DPR. DPR sent responses to OEHHA and ARB on July 30, 2004. On July 12, 2004, Dow provided its comments to DPR, and DPR sent a formal response to Dow on September 8, 2004. While U.S. EPA did not provide formal comments, there was a great deal of interaction at both the departmental and scientist levels, as both agencies are cooperating (and collaborating in some cases) on an evaluation of fumigants.

In their comments, OEHHA complimented the RCD/EAD, calling it an excellent overview and noted that they agreed with it for the most part. OEHHA had several concerns and recommendations. Their primary concern was that DPR should employ, as had U.S. EPA, an additional 10-fold uncertainty factor to address the lack of a developmental neurotoxicity study. OEHHA supported DPR's selection of critical studies and endpoints. OEHHA suggested adding a justification for not evaluating lifetime exposure, adding additional discussion of data gaps, adding a discussion of the inclusion of chloropicrin with the sulfuryl fluoride, adding a discussion of the differences between DPR's and U.S. EPA's breathing rate values, and changing the reentry requirements.

DPR's response indicated that it was also concerned about potential developmental neurotoxicity in humans. U.S. EPA indicated in discussions that it waived the requirement for a developmental neurotoxicity study under an agreement from Dow that this would result in the addition of a 10-fold uncertainty factor. While DPR would have preferred to have experimental data to address this toxic endpoint, the use of the uncertainty factor would expedite the completion of the risk assessment. Accordingly, the revised RCD added the uncertainty factor to its risk calculations. Regarding the evaluation of lifetime exposure, DPR pointed out that lifetime exposure is evaluated when considering carcinogenicity, but that was not an endpoint of concern for this RCD. Noncancer endpoints are assessed in an evaluation of chronic or yearly exposure. Discussions of data gaps and chloropicrin were added as suggested by OEHHA. DPR pointed out that the breathing rates used by DPR did, in fact, basically agree with U.S. EPA's most recently published values. DPR noted that reentry requirements would be addressed at a later time, but they were risk management issues and not really appropriate for inclusion in a risk assessment.

In their comments, ARB noted that the RCD/EAD was well-written but had a few comments. ARB had questions regarding a value that was assumed for bystander exposure to nonfood commodity fumigation, the environmental fate of sulfuryl fluoride in air, and the use of more recent use data. ARB also had additional but more minor concerns. These were addressed in the DPR response to ARB on July 30, 2004, and reflected in the revised RCD/EAD/EFD.

In their July 12 comments on the RCD/EAD, Dow submitted 48 pages of comments. They are available online and are compiled in a volume in DPR's submission to the SRP. The majority of the comments fell into one of two categories--criticizing the critical NOELs DPR selected as being too low (overly conservative) or
the exposure estimates as being too high (also overly conservative). The majority of Dow's document consisted of their scientific arguments for these positions. DPR considered their comments and provided approximately 20 pages of responses to Dow on September 8, 2005, but did not change its NOELs or exposure estimates.

As a result of the comments received, DPR prepared a revised RCD/EAD/EFD that was completed on August 26, 2004. A public comment period on the revised

RCD/EAD/EFD, required under the TAC process, was opened on September 1 and closed on October 15, 2004. A public workshop on the documents was held on September 17, 2004, as part of the Pesticide Registration and Evaluation Committee (PREC) meeting. Written comments were submitted from Dow on October 15, 2004. The comments from Dow on September 15, 2004, were very similar to those submitted by Dow on July 7, 2004. Likewise, DPR's responses (sent April 18, 2005) were similar to those sent earlier. A firm (Foley and Lardner) representing Xtermite (a termite control company using alternative chemicals) also submitted comments on October 15,2004. The comments from Foley and Lardner describe the RCD/EAD as well-articulated and comprehensive, and expressed their concern with the toxicity of sulfuryl fluoride. The comments also stressed several of the comments submitted by OEHHA and ARB on April 4 and 7, 2004, respectively. Most notably, they supported the suggestion of OEHHA to add the additional 10-fold uncertainty factor to address developmental neurotoxicity. DPR sent a formal response to Xtermite on April 5, 2005, addressing their comments and noting that the OEHHA and ARB suggestions mentioned by Foley and Lardner had already been incorporated into the RCD/EAD.

The RCD/EAD/EFD was revised to address, as appropriate, the written public comments and any comments received during the public workshop. DPR sent these documents to the SRP for review on June 5, 2005. DPR also sent the SRP a document that contained all the written comments (from OEHHA, ARB, Dow, Xtermite) and DPR's responses. OEHHA prepared formal findings on sulfuryl fluoride for the SRP on July 1, 2005. The SRP met on July 8, 2005, to consider sulfuryl fluoride. The SRP considered sulfuryl fluoride (as a TAC) and the RCD/EAD/EFD at the meeting. The SRP complimented the completeness and scientific rigor of the evaluation and accepted the RCD/EAD/EFD, as well as the conclusions therein at the meeting, but made several recommendations. Many of these suggested expanded explanations and clearer or better definitions of terms (such as acute, subchronic, and chronic). The SRP recommended increased stress on the neurological effects of sulfuryl fluoride in animals and humans and an expanded discussion of the question of the oncogenicity of sulfuryl fluoride and of fluoride. The comments are addressed in revisions to the RCD/EAD/EFD. DPR scientific staff worked closely with SRP members, especially the two SRP leads, before and after the meeting to address their concerns and recommendations. The SRP members concurred with the changes proposed by DPR. On September 1, 2005, following that concurrence, DPR sent the SRP a formal response outlining the changes.